

CLAIMS

1. A Soller slit for collimating high energy radiation comprising:
a plurality of blades formed from at least a first material having a density less than 6
5 g/cm³, the blades positioned to transmit radiation substantially parallel to the blades
and to absorb divergent radiation.
2. The Soller slit of claim 1, wherein the first material has a density less than 6
10 g/cm³.
3. The Soller slit of claim 1 or 2 having a divergence of less than 0.1° and a
transmission efficiency of at least 60%.
4. The Soller slit of any preceding claim, wherein the first material is glass.
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5. The Soller slit of any of claims 1 to 3, wherein the first material is mica.
6. The Soller slit of any preceding claim, wherein the transmission efficiency is
20 at least 80%.
7. The Soller slit of any preceding claim, wherein the length of each blade is
greater than 5 cm.
8. The Soller slit of claim 7, wherein the length of each blade is at least 12 cm.
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9. The Soller slit of claim 8, wherein the length of each blade is at least 15 cm.
10. The Soller slit of any preceding claim, wherein the thickness of each blade is
30 less than 70 μm.

11. The Soller slit of claim 10, wherein the thickness of each blade is less than 50 μ m.
12. The Soller slit of any preceding claim, wherein the surface of each of the blades is non-reflective to high energy radiation.
13. The Soller slit of claim 12, wherein the surface of each of the blades is non-reflective to X-rays.
14. The Soller slit of claim 12 or 13, wherein the blades each have a non-reflective coating.
15. The Soller slit of claim 12 or 13, wherein the surface of each of the blades is etched in a manner to prevent reflection.
16. A system for performing high energy radiation diffractometry, comprising:
a high energy radiation source;
one or more high energy radiation collimating devices; and
one or more devices for collecting high energy radiation after the high energy radiation impinges on a sample to be examined;
wherein the or each high energy collimating device comprises a plurality of collimating members formed from at least a first material having a density less than 6 g/cm³.
17. The diffractometry system of claim 16, wherein the or each high energy collimating device has a divergence of less than 0.1° and a transmission efficiency of at least 60%.
18. The diffractometry system of claim 16 or 17, wherein the high energy radiation comprises X-ray radiation.

19. The diffractometry system of claim 16 or 17, wherein the high energy radiation comprises extreme ultraviolet (EUV) radiation.
20. The diffractometry system of any of claims 16 to 19, wherein the high
5 energy radiation collimating device comprises of one or more Soller slit devices.
21. The diffractometry system of any of claims 16 to 20, wherein the first material is glass.
- 10 22. The diffractometry system of any of claims 16 to 20, wherein the low density material comprises mica.